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Daily PIB Summary

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1. MANAS: A DIGITAL SHIELD AGAINST DRUGS

- MANAS is a digital platform that enables citizens to anonymously report drug trafficking, drug abuse, and related illegal activities.
- The initiative strengthens intelligence gathering and public participation in narcotics control.
- Digital reporting facilitates timely action by enforcement agencies while protecting the identity of informants.
- MANAS complements India's broader strategy of demand reduction, supply control, and rehabilitation.
- The platform promotes community involvement in combating the menace of narcotic drugs and psychotropic substances.
- It supports technology-driven governance and improves coordination among enforcement agencies.
- The initiative contributes to public health, social security, and national security by addressing drug-related crimes.
- MANAS reflects the increasing use of digital technologies in law enforcement and citizen-centric governance.

BACKGROUND / CONTEXT

What is MANAS?

I. **MANAS (Madak Padarth Nishedh Asuchna Kendra)** is the **National Narcotics Helpline**.

II. It provides a digital platform for citizens to report:
   A. Drug trafficking.
   B. Drug peddling.
   C. Illegal cultivation.
   D. Drug abuse.

III. Allows confidential and anonymous reporting.

Nodal Agency

- Operated by the **Narcotics Control Bureau**.
- Functions under the **Ministry of Home Affairs**.

Legal Framework

- **Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985**.
- Regulates production, possession, sale, transport, and consumption of narcotic drugs and psychotropic substances.

National Action Plan for Drug Demand Reduction (NAPDDR)

I. Implemented by the **Ministry of Social Justice and Empowerment**.

II. Focuses on:
   A. Awareness.
   B. Prevention.
   C. Treatment.
   D. Rehabilitation.
   E. Capacity building.

KEY HIGHLIGHTS

- **Platform:** MANAS (National Narcotics Helpline).
- **Objective:** Enable anonymous reporting of drug-related offences.
- **Nodal Agency:** Narcotics Control Bureau (NCB).

- **Governance Impact:** Strengthens citizen participation and intelligence-led enforcement.
- **Technology:** Digital reporting platform with confidential information sharing.
- **Social Significance:** Supports drug abuse prevention and public safety.
- **Challenges:** Drug trafficking networks, cross-border smuggling, cyber-enabled narcotics trade, and rehabilitation gaps.
- **Way Forward:** Strengthen public awareness, improve inter-agency coordination, expand rehabilitation services, and leverage AI and digital technologies for narcotics control.

PRELIMS BOOSTER BOX

- **MANAS: Madak Padarth Nishedh Asuchna Kendra** (National Narcotics Helpline).
- **Nodal Agency:** Narcotics Control Bureau (NCB).
- **Administrative Ministry:** Ministry of Home Affairs.
- **Parent Law: Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985**.
- **NCB:** Established in **1986**.
- **NAPDDR:** National Action Plan for Drug Demand Reduction.
- **Psychotropic Substance:** Substance affecting mental processes such as perception, mood, or behaviour.
- **Narcotic Drug:** Substance capable of producing dependence and addiction as defined under the NDPS Act.
- **Golden Crescent:** Afghanistan–Iran–Pakistan region, a major source of illicit opiates.
- **Golden Triangle:** Myanmar–Laos–Thailand region, another major illicit drug-producing area.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

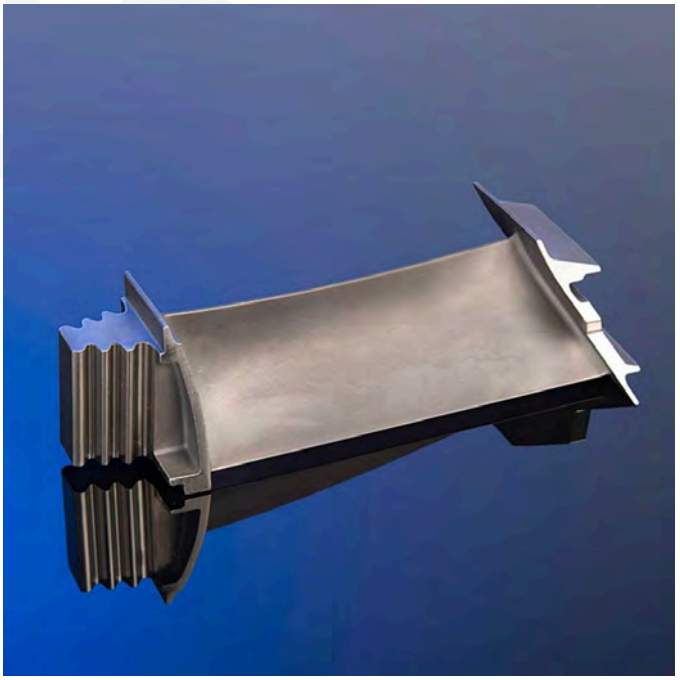
1. MANAS is the National Narcotics Helpline operated by the Narcotics Control Bureau.
2. The Narcotic Drugs and Psychotropic Substances (NDPS) Act was enacted in 1985.
3. The National Action Plan for Drug Demand Reduction (NAPDDR) is implemented by the Ministry of Home Affairs.

Which of the statements given above is/are correct?

(a) 1 only
(b) 1 and 2 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (b)

2. BREAKTHROUGH IN SUPERALLOY BI-METALLIC STRUCTURES THROUGH ADDITIVE MANUFACTURING CAN REDUCE IMPORT OF SUPERALLOYS



- Researchers have successfully fabricated bi-metallic superalloy structures using additive manufacturing techniques.
- The breakthrough enables the production of complex, high-performance components with improved material efficiency and reduced manufacturing waste.

- Indigenous production of superalloys can significantly reduce import dependence for critical sectors such as aerospace, defence, nuclear energy, and power generation.
- Additive manufacturing allows precise control over material properties and enables fabrication of geometries that are difficult using conventional methods.
- The innovation supports the objectives of **Aatmanirbhar Bharat** by strengthening domestic advanced manufacturing capabilities.
- The technology has the potential to reduce production costs, improve supply chain resilience, and accelerate industrial innovation.
- It also contributes to strategic self-reliance in critical materials and high-end engineering applications.
- The breakthrough reinforces India's growing capabilities in materials science and advanced manufacturing.

BACKGROUND / CONTEXT

Superalloys

I. High-performance alloys capable of retaining strength at extremely high temperatures.
II. Commonly based on:
    A. Nickel.
    B. Cobalt.
    C. Iron.
III. Widely used in:
    A. Aircraft engines.
    B. Gas turbines.
    C. Space applications.
    D. Nuclear reactors.
    E. Defence systems.

Bi-metallic Structures

- Components manufactured using two different metals or alloys.
- Designed to combine the advantages of each material.
- Improve strength, durability, thermal resistance, and cost efficiency.

Additive Manufacturing (3D Printing)

I. Manufacturing process where components are built layer by layer from digital designs.
II. Enables:
    A. Complex geometries.
    B. Reduced material wastage.
    C. Rapid prototyping.
    D. Customized manufacturing.

Strategic Importance

- Reduces dependence on imported critical materials.
- Supports indigenous defence and aerospace manufacturing.
- Enhances supply chain resilience.
- Promotes high-value manufacturing and technological innovation.

KEY HIGHLIGHTS

- **Breakthrough:** Development of superalloy bi-metallic structures using additive manufacturing.
- **Technology:** Advanced metal 3D printing.
- **Strategic Significance:** Reduces import dependence on critical superalloys.
- **Applications:** Aerospace, defence, power generation, nuclear energy, and space sectors.
- **Economic Impact:** Strengthens domestic manufacturing and improves supply chain resilience.
- **Innovation:** Enables complex component manufacturing with minimal material wastage.
- **Challenges:** High production costs, specialized equipment, material qualification, and large-scale commercialization.
- **Way Forward:** Expand indigenous R&D, strengthen industry-academia collaboration, develop domestic superalloy production capabilities, and scale advanced manufacturing infrastructure.

PRELIMS BOOSTER BOX

- **Superalloys:** High-temperature-resistant alloys used in critical engineering applications.
- **Common Base Metals:** Nickel, cobalt, and iron.
- **Additive Manufacturing:** Layer-by-layer manufacturing process from digital models.
- **3D Printing Advantage:** Minimal material wastage and complex geometries.
- **Bi-metallic Structure:** Component combining two different metals for enhanced performance.
- **Nickel-Based Superalloys:** Widely used in jet engines and gas turbines.
- **Gas Turbine:** Converts thermal energy into mechanical energy for power generation and aviation.
- **Powder Bed Fusion:** Common metal additive manufacturing technique using laser or electron beam.
- **Aatmanirbhar Bharat:** Initiative promoting self-reliance in strategic manufacturing.
- **Advanced Materials:** Materials engineered to provide superior mechanical, thermal, or chemical properties.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

1. Superalloys are designed to retain their mechanical strength at very high temperatures.
2. Additive manufacturing builds components layer by layer from a digital model.
3. Nickel-based superalloys are widely used in aircraft engines and gas turbines.

Which of the statements given above is/are correct?

(a) 1 only
(b) 1 and 2 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (d)

3. NRAA-FUNDED WILD RICE CONSERVATION PROJECT SECURES MAJOR MILESTONE IN ASSAM

- The project aims to conserve wild rice populations in their natural habitats while preserving their genetic diversity.
- Wild rice species possess valuable traits such as resistance to pests, diseases, drought, floods, and salinity, making them important for future crop breeding.
- Conservation of these genetic resources enhances climate-resilient agriculture and supports long-term food security.
- The initiative promotes sustainable management of agro-biodiversity and complements national biodiversity conservation efforts.

- Scientific documentation and habitat protection improve the availability of genetic material for agricultural research.
- The project contributes to strengthening India's capacity to develop resilient rice varieties in the face of climate change.
- It also supports conservation of ecologically sensitive wetland ecosystems.
- The milestone reinforces the importance of integrating biodiversity conservation with agricultural development.

BACKGROUND / CONTEXT

National Rainfed Area Authority (NRAA)

- Established in **2006**.
- Functions under the **Department of Agriculture & Farmers Welfare**.
- Focuses on sustainable development of rainfed agriculture through integrated natural resource management.

Wild Rice

I. Wild relatives of cultivated rice that occur naturally in wetlands and marshes.

II. Possess important genes for:

   A. Disease resistance.

   B. Pest resistance.

   C. Flood tolerance.

   D. Drought tolerance.

   E. Salinity tolerance.

III. Used extensively in crop improvement programmes.

Oryza rufipogon

- Scientific name of one of the most important wild relatives of cultivated rice.
- Considered a progenitor of Asian cultivated rice (**Oryza sativa**).
- Found in wetlands and marshy habitats across parts of Asia, including Assam.

Importance of Genetic Diversity

- Enhances resilience against climate change.
- Supports development of improved crop varieties.
- Conserves valuable germplasm for future breeding programmes.
- Strengthens food and nutritional security.

KEY HIGHLIGHTS

- **Project:** NRAA-funded Wild Rice Conservation Project in Assam.
- **Objective:** Conserve wild rice genetic resources and their natural habitats.
- **Scientific Importance:** Supports development of climate-resilient rice varieties.
- **Environmental Significance:** Conserves biodiversity and wetland ecosystems.
- **Agricultural Impact:** Enhances food security through improved crop breeding.
- **Research Value:** Preserves valuable germplasm for future agricultural innovation.
- **Challenges:** Habitat degradation, urbanization, invasive species, and climate change.
- **Way Forward:** Strengthen in-situ and ex-situ conservation, expand genetic research, protect wetlands, and promote community participation in biodiversity conservation.

PRELIMS BOOSTER BOX

- **NRAA:** National Rainfed Area Authority.
- **Established: 2006**.
- **Scientific Name of Wild Rice: Oryza rufipogon**.
- **Cultivated Rice: Oryza sativa**.
- **Germplasm:** Living genetic resources used for crop improvement.
- **In-situ Conservation:** Conservation of species in their natural habitats.
- **Ex-situ Conservation:** Conservation outside natural habitats (seed banks, gene banks, botanical gardens).
- **Agro-biodiversity:** Diversity of plants, animals, and microorganisms used in agriculture.

- **Wetlands:** Ecosystems where water is the primary factor controlling the environment and associated biodiversity.
- **Climate-Resilient Agriculture:** Agricultural practices and crop varieties capable of withstanding climate variability.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

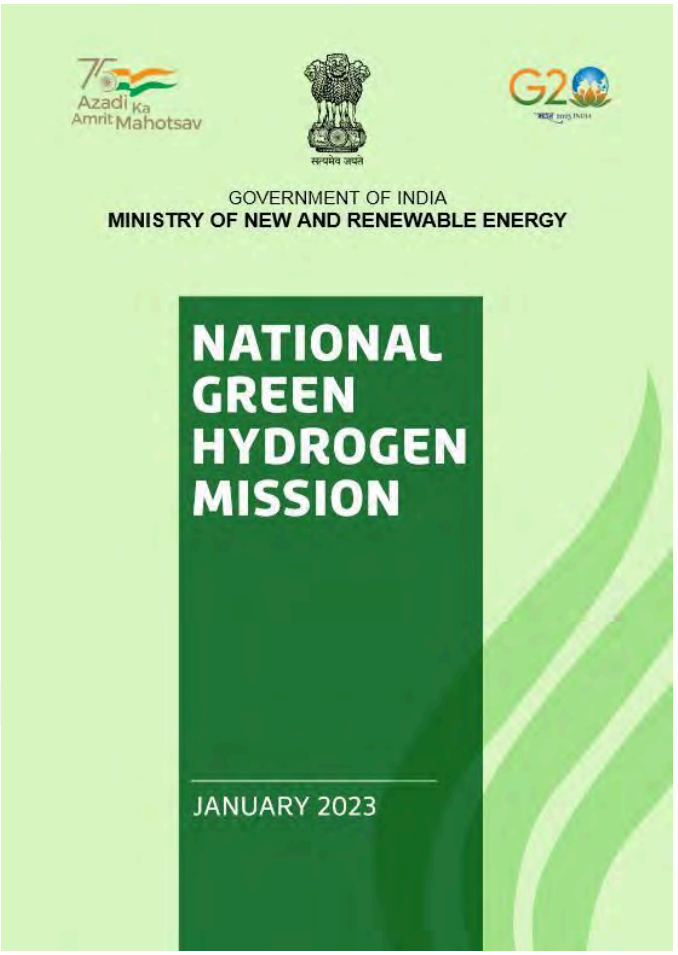
1. *Oryza rufipogon* is a wild relative of cultivated rice.
2. Wild rice species serve as important genetic resources for developing climate-resilient rice varieties.
3. In-situ conservation refers to conserving species outside their natural habitats.

Which of the statements given above is/are correct?

(a) 1 only
(b) 1 and 2 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (b)

4. INDIA ADVANCES GLOBAL GREEN HYDROGEN LEADERSHIP UNDER NATIONAL GREEN HYDROGEN MISSION



- The National Green Hydrogen Mission aims to position India as a global producer, consumer, and exporter of green hydrogen and its derivatives.
- The Mission promotes domestic manufacturing of electrolysers, scaling up renewable energy integration, and developing green hydrogen production capacity.
- Green hydrogen is expected to decarbonize hard-to-abate sectors such as steel, refineries, fertilizers, shipping, and heavy transport.

- The initiative enhances India's energy security by reducing dependence on imported fossil fuels and natural gas.
- It is expected to generate employment, attract investments, and strengthen India's clean technology ecosystem.
- The Mission aligns with India's climate commitments and long-term sustainable development objectives.
- International partnerships and technology collaboration are expected to enhance India's competitiveness in the global hydrogen economy.
- The Mission represents a key pillar of India's transition towards a low-carbon and self-reliant energy future.

BACKGROUND / CONTEXT

National Green Hydrogen Mission (NGHM)

I. Approved in **January 2023**.
II. **Nodal Ministry:** Ministry of New and Renewable Energy (MNRE).
III. Vision:
   A. Make India a global hub for green hydrogen production.
   B. Promote exports.
   C. Encourage domestic manufacturing of electrolysers.
   D. Support research, innovation, and skill development.

Green Hydrogen

- Produced by electrolysis of water using electricity generated from renewable energy sources.
- Generates **no carbon emissions** during production.

Hydrogen Colours

- **Green Hydrogen:** Produced using renewable energy.
- **Grey Hydrogen:** Produced from natural gas without carbon capture.
- **Blue Hydrogen:** Produced from fossil fuels with carbon capture and storage (CCS).

Applications

- Fertilizer industry.
- Petroleum refineries.
- Steel manufacturing.
- Heavy transport.
- Shipping.
- Energy storage.

KEY HIGHLIGHTS

- **Mission:** National Green Hydrogen Mission.
- **Nodal Ministry:** Ministry of New and Renewable Energy.
- **Objective:** Make India a global hub for green hydrogen production and exports.
- **Strategic Significance:** Strengthens energy security and supports clean energy transition.
- **Economic Impact:** Encourages investments, manufacturing, innovation, and employment generation.
- **Environmental Impact:** Reduces greenhouse gas emissions and supports net-zero goals.
- **Challenges:** High production costs, electrolyser availability, storage, transportation, and infrastructure requirements.
- **Way Forward:** Scale up renewable energy capacity, promote domestic electrolyser manufacturing, strengthen R&D, develop hydrogen infrastructure, and expand international cooperation.

PRELIMS BOOSTER BOX

- **National Green Hydrogen Mission:** Approved in **January 2023**.
- **Nodal Ministry:** Ministry of New and Renewable Energy (MNRE).
- **Green Hydrogen:** Produced through electrolysis using renewable energy.
- **Electrolysis:** Process of splitting water into hydrogen and oxygen using electricity.

- **Grey Hydrogen:** Produced from natural gas without carbon capture.
- **Blue Hydrogen:** Produced from fossil fuels with carbon capture and storage (CCS).
- **Electrolyser:** Device that produces hydrogen by electrolysing water.
- **Hard-to-Abate Sectors:** Industries where emissions are difficult to eliminate, such as steel, cement, fertilizers, and shipping.
- **Net Zero:** Balancing greenhouse gas emissions with their removal from the atmosphere.
- **Renewable Energy Sources:** Solar, wind, hydro, biomass, and geothermal energy.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

1. Green hydrogen is produced through electrolysis of water using electricity generated from renewable energy sources.
2. The Ministry of New and Renewable Energy is the nodal ministry for the National Green Hydrogen Mission.
3. Grey hydrogen is produced using renewable energy without carbon emissions.

Which of the statements given above is/are correct?

(a) 1 only
(b) 1 and 2 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (b)

5. COAL IMPORTS DECLINE BY NEARLY 13% IN APRIL 2026, REFLECTING STEADY PROGRESS TOWARDS IMPORT SUBSTITUTION

- The decline in coal imports indicates improved domestic availability and greater reliance on indigenous coal production.
- Import substitution helps reduce the country's import bill and strengthens energy security.
- Increased domestic coal production supports uninterrupted fuel supply to power plants and key industrial sectors.
- The initiative aligns with the Government's efforts to achieve self-reliance in the energy sector under **Aatmanirbhar Bharat**.
- Reduced imports contribute to improving the current account balance and conserving foreign exchange.
- Domestic coal continues to play a significant role in ensuring reliable electricity generation during the energy transition.
- Simultaneously, India is expanding renewable energy while ensuring energy affordability and grid stability.
- The development highlights the importance of balancing energy security, economic growth, and environmental sustainability.

BACKGROUND / CONTEXT

Coal Sector in India

I. Coal remains the primary source of electricity generation in India.

II. Used extensively in:

A. Thermal power generation.

B. Steel industry.

C. Cement industry.

D. Other energy-intensive industries.

Import Substitution

I. Strategy to replace imported goods with domestically produced alternatives.

II. Benefits include:

A. Reduced import dependence.

B. Savings in foreign exchange.

C. Strengthened domestic industries.

D. Enhanced supply chain resilience.

Major Institutions

- **Ministry of Coal** is responsible for policy formulation and development of the coal sector.
- **Coal India Limited** is the world's largest coal-producing company.

Energy Security

- Ensures reliable, affordable, and uninterrupted energy supply.
- Requires diversification of energy sources while strengthening domestic production.

KEY HIGHLIGHTS

- **Trend:** Coal imports declined by nearly 13% in April 2026.
- **Objective:** Reduce dependence on imported coal through domestic production.
- **Economic Significance:** Saves foreign exchange and improves the current account balance.
- **Energy Security:** Strengthens reliable fuel availability for power generation and industry.
- **Strategic Importance:** Supports Aatmanirbhar Bharat and domestic resource utilization.
- **Environmental Perspective:** Improved mining efficiency alongside expansion of renewable energy supports balanced energy transition.
- **Challenges:** Rising energy demand, logistics constraints, environmental concerns, and ensuring sustainable mining.
- **Way Forward:** Enhance domestic coal production, modernize mining technologies, improve transportation infrastructure, promote clean coal technologies, and accelerate renewable energy deployment.

PRELIMS BOOSTER BOX

- **Ministry of Coal:** Nodal ministry for coal sector development.
- **Coal India Limited (CIL):** World's largest coal-producing company.
- **Import Substitution:** Replacement of imports with domestic production.
- **Current Account Deficit (CAD):** Difference between a country's imports and exports of goods, services, and transfers.
- **Thermal Power:** Electricity generated by burning fossil fuels such as coal.
- **Coking Coal:** Used primarily in steel manufacturing.
- **Non-Coking Coal:** Used mainly for power generation.
- **Coal Gasification:** Conversion of coal into synthesis gas (syngas) for industrial use.
- **Energy Security:** Reliable, affordable, and sustainable energy availability.
- **Aatmanirbhar Bharat:** Initiative to strengthen domestic manufacturing and reduce import dependence.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

1. Coking coal is primarily used in steel manufacturing.

2. Import substitution aims to replace imported goods with domestically produced alternatives.
3. Coal India Limited is the world's largest coal-producing company.

Which of the statements given above is/are correct?

(a) 1 only
(b) 1 and 2 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (d)